

Scalable Solution Processing of Pristine Carbon Nanotubes for Self-Assembled, Tunable Materials with Direct Application to Space Technologies

Completed Technology Project (2014 - 2018)



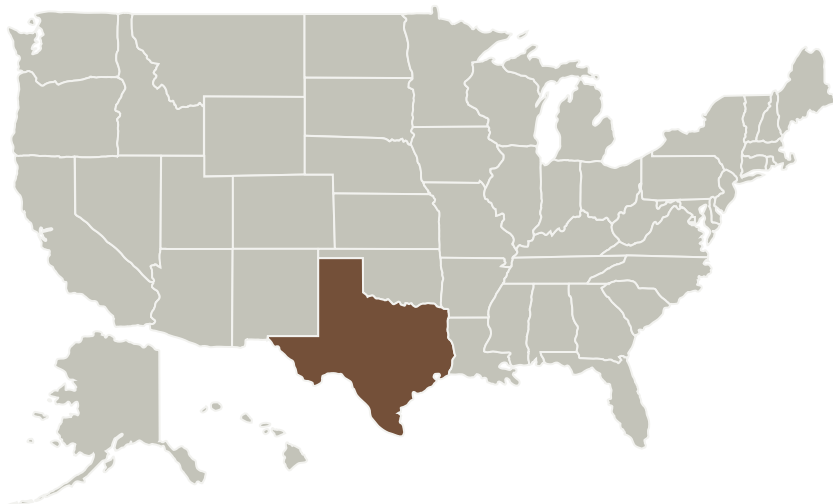
Project Introduction

Current material technologies limit space exploration and vehicle performance due to often unnecessary mass increase from copper wiring or heavy structural composites. Replacement of these materials to impart lower mass footprints should alleviate this stress and improve equipment efficiency. Fortunately, the discovery of carbon nanotubes in 1991 has led to the production of strong, highly conductive carbon nanotube fibers that compete with current material platforms. In this proposal, the current challenges associated with assembling carbon nanotubes via dissolution in chlorosulfonic acid will be identified along with prospective studies to surpass the properties of copper and traditional carbon fiber for direct application to space technologies.

Anticipated Benefits

The current challenges associated with assembling carbon nanotubes via dissolution in chlorosulfonic acid will be identified along with prospective studies to surpass the properties of copper and traditional carbon fiber for direct application to space technologies.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Rice University	Lead Organization	Academia	Houston, Texas

Primary U.S. Work Locations
Texas

Project Website:

<https://www.nasa.gov/directorates/spacetech/home/index.html>

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Rice University

Responsible Program:

Space Technology Research Grants

Project Management

Program Director:

Claudia M Meyer

Program Manager:

Hung D Nguyen

Principal Investigator:

Matteo Pasquali

Co-Investigator:

Robert J Headrick

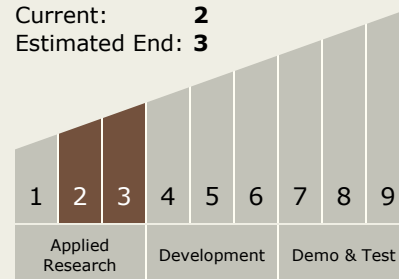
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Technology Maturity (TRL)

Start: 2
Current: 2
Estimated End: 3



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.1 Lightweight Structural Materials

Target Destination

Foundational Knowledge